



A.D. 1799 N^o 2344.

S P E C I F I C A T I O N

OF

ANTHONY GEORGE ECKHARDT.

FIRE GRATES.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,
25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 9s.

1855.



A.D. 1799 N^o 2344.

Fire Grates.

ECKHARDT'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ANTHONY GEORGE ECKHARDT, of Queen's Buildings, Knightsbridge, Gentleman, Fellow of the Royal Society, send greeting.

WHEREAS His most Excellent Majesty King George the Third did, by
5 His Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Third day of October, in the thirty-ninth year of His reign, give and grant unto me, the said Anthony George Eckhardt, His especial licence that I, the said Anthony George Eckhardt, during the term of years therein mentioned, should and lawfully might use, exercise, and vend, within
10 England, Wales, and the Town of Berwick-upon-Tweed, my Invention of "**A NEW MODE OF CONSTRUCTING AND MOVING THE BACK AND BOTTOM OF FIRE GRATES, COMBINED WITH CHEEKS ON A NEW CONSTRUCTION WHICH IS PARTICULARLY ADAPTED FOR KITCHEN RANGES, AND CAN BE APPLIED TO OTHER GRATES, BY WHICH A GREAT SAVING OF FUEL WILL BE OBTAINED;**" in which said Letters Patent there is contained
15 a proviso obliging me, the said Anthony George Eckhardt, by an instrument in writing under my hand and seal, to cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be inrolled in His Majesty's High Court of Chancery within one calendar month after the date of the said Letters Patent.

20 **NOW KNOW YE**, that in compliance with the said proviso, I, the said Anthony George Eckhardt, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, is particularly described and ascertained in the Drawings hereunto annexed, and in manner and form following (that is to say) :—

Eckhardt's new Mode of Constructing Fire Grates, &c.

My Invention consists in having discovered a new mode of moving the back or back plate or plates of fire-grates of all descriptions, and to move it or them on a spindle or on spindles, instead of moving them in a parallel direction, either in a vertical or horizontal direction, by a winch or crank; the back plate or plates are made to move towards the bars or from them, so as to admit of more 5 or less fuel, according to circumstances, when more or less heat is necessary.

Fig. 1, 2, 3, 4, 5, 6, and 7, represent in how many modes the spindle or axis may be applied to the back plate or plates.

Fig. 1 and 2 is a side view; A, B, represent the back of the fire-grate; B, D, the bottom; and C, D, the front bars of the grate. In Fig. 1 the back 10 is made to move on a horizontal axis or pivot underneath, marked by a little circle B; and the dotted line A, C, represents the movement. In Fig 2, A, B, is again the back, and C, D, the front bars, and in that the back plate is made to move by a horizontal spindle on the top marked A; and the dotted line B, D, represents the movement. 15

Fig. 3 represents the same construction, only with this difference, that the back is fixt to the bottom, and moves together on a horizontal spindle or axis marked by the little circle D.

In Fig. 4 the back is made to move the same as in Fig. 2, but the bottom B, F, is made to move on a false bottom E, D. In these Figures 1, 2, 3, 4, the 20 back may be made to move without pivots, by rounding the bottom edge either or without a groove, and I claim the right of making them in that way, as well as to act on pivots.

Fig. 5 represents a top view of the fire-grate; A, B, the back, and D, C, the front bars of the grate; the back is made to move on a vertical axis or pivot B 25 on one side, which may also be applied to the other; and the dotted line D, A, represents the movement.

Fig. 6 and 7 represent the back in two plates, each moveable on a vertical axis marked B, B, and B, the one in Fig. 6. The back is made to move on an axis or spindle on each side; and in Fig. 7. on an axis or spindle in the 30 middle.

This all being well understood, it will be easy to conceive that the mode of moving the back or back plates on those spindles may be done in various ways, by racks or wheels and pinions, or by worms, or by levers, or compound together; all which applications I claim the right of, as the construction of 35 them must be according to circumstances. With respect to the application for kitchen ranges, the mode of Fig. 1, 2, 3, and 4 is the most applicable for that purpose; then, in order to admit cheeks as in common, my Invention is to make them, instead of one, to consist of two or more pieces or plates connected

A diagram of a bent lever. A fulcrum is labeled 'A' at the top vertex of the lever. The lever arm extends downwards and to the left to point 'B', and then turns to extend horizontally to the right to point 'F'. A weight 'E' is shown hanging from the horizontal arm. To the right of the lever is a vertical column with several diamond-shaped weights stacked on top of each other.

A diagram showing a circular sector with vertex B. The radius is labeled AB. The arc is labeled AC. The sector is shaded with diagonal lines. The diagram illustrates the construction of a circular segment from a sector.

A diagram of a lever. A horizontal bar is pivoted at point A on the right. Point B is at the left end of the bar. A curved arrow indicates a downward force at B. The bar is labeled 'A' at the fulcrum and 'B' at the effort point.

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1855.

Drawn in Stone by Maitly & Sons

Eckhardt's new Mode of Constructing Fire Grates, &c.

together with an axis or pivots, moveable like a fan, so as to fit at any position of the back plate.

In respect to the front bars, Figs. 8 and 9 represent a side view of those cheeks, made of two pieces, in the fire-grate; A, B, represents the back plates, and C, D, the front bars, and the cheeks are represented by two plates *a, a*, & *b, b*, moveable on a centre marked *d*. These cheeks are also made to wind in the usual manner, and they may be made applicable to all the before-mentioned cases.

I have not delineated in the nine preceding Figures the mode of moving the back plate or plates and cheeks, in order to prevent confusion; but by way of example I annex a Drawing, showing how the principle may be applied to kitchen ranges. To delineate all the modes would be too prolix, and it must be left to any one conversant in machines to make use of the several modes according to circumstances.

15 DESCRIPTION OF THE KITCHEN RANGE.

As the principle of my improvement is sufficiently described, and several parts in this fire-grate are like those in common use, a minute description will be unnecessary. Fig. 15 represents the front view, 17 the back, 10 and 16 the side view. In these Figures D, E, represent the front bars of the grate; 20 Fig. 10 and 15, L and L are the hobs; M and M are the figured fronts. In this construction the back is made in two pieces; the top one, I, K, in Figure 10, and I, I, K, Figs. 15 and 17, is fixed as a common back; the other, A, B, Fig. 10, A, Fig. 15, and A, A, B, Fig. 17, is fixed to the grating bottom C, C, by three small plates, *ef, ef, ef*, Fig. 17, thereby constituting 25 one piece, and may be cast in one together; this back and bottom is made moveable on two horizontal pivots, G and G, Fig. 17, and by G, Figs. 10 and 16. To this back plate is put a circular iron plate A, *g*, Fig. 10, which prevents the fuel falling behind when the back is moved forward. N, N, N, O, Fig. 10, and N, N, N, O, Fig. 15, are the cheeks of the grate, 30 made in two pieces, connected together by a pivot O, and made moveable like a fan; the shape of each piece is described in Figs. 10, 11, 12; the back one, N, A, O, Figs. 10 and 12, is fixed to the moveable back by a screw and nut *l*, Figs. 10 and 12; the other part, N, N, O, Figs. 10 and 11, is fixed to the front bars by a hook *n*, Figs. 10, 11, 15. These cheeks are made to move 35 in a horizontal direction, like the common cheeks, so as to contract or enlarge the space of the fire-grate. The mode of moving these cheeks is the same as is practised in common by a rack pinion, &c. &c. worked by a crank. In order to move the back and grating bottom forward or backward, I have established a

Eckhardt's new Mode of Constructing Fire Grates, &c.

lever T, U, Fig. 17, at the back of the grate; the fulcrum *m* is supported on the carriage R, R, and S, S, Figs. 14, 16, 17; on the extremity of this lever is a hook T, Figs. 14, 17, which takes hold of the back by means of a staple W, Figs. 14, 17; and to move the said lever with solidity and power I have contrived a tooth wheel, X, X, Fig. 13, 14, 16, which is made moveable by a 5 worm Z, Z, same Figs.; to this wheel is fixed a short lever Y, Y, Y, same Figs., or may be cast with the wheel, so that when the crank or winch Q, Figs. 14, 15, turns the worm, the wheel is moved, and consequently lowers or raises the short lever Y, Y, Y, which being connected to the long lever at U, Figs. 14, 17, lowers or raises that lever at one end, and raises or lowers the back and 10 grating bottom at the other end.

In witness whereof, I, the said Anthony George Eckhardt, have hereunto set my hand and seal, this Second day of November, in the year of our Lord One thousand seven hundred and ninety-nine.

A. G. ECKHARDT. (L.S.) 15

T. WALKER. **AND BE IT REMEMBERED**, that on the same Second day of November in the year above mentioned, the aforesaid Anthony George Eckhardt came before our Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained, in form above written. And also the Specification aforesaid was stamped according to the tenor of the 20 Statute in that case made and provided.

Inrolled the same Second day of November, in the year above written.

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1855.